

Claims

1. A microorganism which is Rhodococcus rhodochrous strain NCIMB 41164 or a mutant thereof.
- 5 2. A method of culturing the microorganism Rhodococcus rhodochrous strain NCIMB 41164 or mutant thereof in a culture medium that contains urea or a derivative of urea.
- 10 3. A method according to claim 2 in which urea or urea derivative is introduced into the culture medium at least six hours after the start of growth of the microorganism.
- 15 4. A method according to claim 2 or claim 3 in which the culture medium contains less than 0.2 g/l urea or the urea derivative for at least the first 6 hours of culturing the microorganism and thereafter urea or the urea derivative is added to the culture medium.
- 20 5. A method according to any of claims 2 to 4 in which the culture medium contains less than 0.2 g/l urea or the urea derivative for at least the first 12 hours of culturing the microorganism and thereafter urea or the urea derivative is added to the culture medium.
- 25 6. A method according to any of claims 2 to 5 in which urea or the urea derivative is added to the culture medium within 48 hours of culturing.
7. A nitrile hydratase obtainable from a microorganism which is Rhodococcus rhodochrous strain NCIMB 41164 or a mutant thereof.
- 30 8. A process of preparing an amide from the corresponding nitrile wherein the nitrile is subjected to a hydration reaction in an aqueous medium in the presence of a biocatalyst selected from the group consisting of a microorganism

which is a *Rhodococcus rhodochrous* strain NCIMB 41164, a mutant thereof and a nitrile hydratase obtainable from *Rhodococcus rhodochrous* strain NCIMB 41164 or a mutant thereof.

- 5 9. A process according to claim 8 in which the amide is (meth)acrylamide.
10. A process according to claim 9 in which the biocatalyst is introduced into an aqueous medium and (meth)acrylonitrile is fed into the aqueous medium such that the concentration of (meth)acrylonitrile in the aqueous medium is maintained at up to 6% by weight.
11. A process according to claim 10 in which the reaction continues until the concentration of acrylamide is between 30 and 55% by weight.
- 15 12. A process according to any of claims 8 to 11 in which the biocatalyst is recycled and reused.
13. A method of improving the biocatalytic activity of a microorganism, in which the microorganism is cultured in a culture medium that comprises urea or 20 a derivative of urea , wherein urea or the derivative of urea is introduced into the culture medium at least 6 hours after the start of growth of the microorganism.
14. A method according to claim 13 in which the culture medium contains less than 0.2 g/l urea or the derivative of urea for at least the first 6 hours of culturing the microorganism and thereafter urea or the derivative of urea is added to the culture medium.
15. A method according to claim 13 or claim 14 in which the culture medium 30 contains less than 0.2 g/l urea or the derivative of urea for at least the first 12

hours of culturing the microorganism and thereafter urea or the derivative of urea is added to the culture medium.

16. A method according to any of claims 13 to 15 in which urea or the urea derivative is added to the culture medium within 48 hours of culturing.  
5
17. A method according to any of claims 13 to 16 in which the microorganism is capable of producing a nitrile hydratase.
- 10 18. A method according to any of claims 13 to 17 in which the microorganism is of the *Rhodococcus* genus, preferably *Rhodococcus rhodochrous* species.
- 15 19. A process of preparing an amide from the corresponding nitrile wherein the nitrile is subjected to a hydration reaction in an aqueous medium in the presence of a biocatalyst selected from the group consisting of a microorganism which is capable of producing a nitrile hydratase, wherein the microorganism has been cultured by the method according to any of claims 13 to 18.
- 20 20. A process according to claim 19 in which the amide is (meth) acrylamide.
21. A process according to claim 19 in which the biocatalyst is introduced into an aqueous medium and (meth)acrylonitrile is fed into the aqueous medium such that the concentration of (meth)acrylonitrile in the aqueous medium is  
25 maintained at up to 6% by weight.
22. A process according to claim 21 in which the reaction continues until the concentration of acrylamide is between 30 and 55% by weight.
- 30 23. A process according to any of claims 19 to 22 in which the biocatalyst is recycled and reused.

24. An aqueous composition comprising a biocatalyst that is or is obtainable from the microorganism *Rhodococcus rhodochrous* strain NCIMB 41164 or a mutant thereof and wherein the biocatalyst is in the form of a non-actively growing free cell microorganism.
- 5
25. A method of storing the biocatalyst that is or is obtainable from the microorganism *Rhodococcus rhodochrous* strain NCIMB 41164 or a mutant thereof in the form of a non-actively growing free cell microorganism, in an aqueous storage medium.
- 10
26. A method according to claim 25 in which the biocatalyst is stored at a temperature above its freezing point, preferably above 0°C and more preferably between 4 and 30°C.
- 15
27. A method according to claim 25 or claim 26 in which the biocatalyst is stored for a period of at least two days, preferably between 3 and 28 days and more preferably between 5 and 14 days.
- 20 28. A composition obtainable by the method according to any of claims 25 to 27.
- 25
29. A nitrile hydratase obtainable from the composition according to claim 24 or obtainable by the method according to any of claims 25 to 27.
30. A method of producing an amide by contacting the corresponding nitrile with a nitrile hydratase,  
wherein the nitrile hydratase is obtainable from a composition according to claim 24 or obtainable by a method according to claims 25 to 27.
- 30
31. A method according to claim 30 in which the amide is (meth)acrylamide.